

## Clinico-etiological pattern of lower gastrointestinal bleeding in children (5-18 years age group) at a tertiary care center in central India

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### ABSTRACT

**Background:** Lower gastrointestinal bleeding (LGIB), defined as bleeding occurring distal to the ligament of Treitz, is a common presenting symptom in pediatric patients. **Objective:** To understand the clinico-etiological pattern of LGIB in children in the age group 5-18 years. **Materials and Methods:** This prospective study was carried out at a tertiary health-care center in central India between January 2011 and August 2012. We consecutively enrolled all patients in the age group 5-18 years who came to our center with gross LGIB or two consecutive positive occult blood tests with at least 1-week interval between tests. All patients underwent colonoscopy (small, flexible Olympus PCF-20 colonoscope) and the findings were recorded. The procedure was done only after proper informed consent from the parents. **Results:** Total 38 patients were included in the study with above-mentioned inclusion and exclusion criteria, during the study period. Male to female ratio in LGIB was 2.16:1. LGIB was most common in children aged 5-10 years (63.1%), followed by 10-14 years (26.3%). Hematochezia was the most common presenting symptom (78.9%) followed by melena (21.1%). The most common causes of LGIB were colitis and colorectal polyp (31.6% each) followed by anal fissures (21.1%). Anemia was present in 68.4% patients at the time of presentation. Recurrence of LGIB was noted in 18 (47.4%) patients. **Conclusion:** We conclude that LGIB is most common in 5-10 years of children (school age) with hematochezia as the most common presenting symptom. Causes of LGIB in children in developing countries are same as developed countries (polyps and colitis being most common, followed by anal fissure), but further studies are required to determine the significant correlation between findings.

**Key words:** Lower gastrointestinal bleeding, Children, Central India, Colonoscopy

Gastrointestinal (GI) bleeding can be divided into upper and lower, depending on whether it is originating proximal or distal to the ligament of Treitz. Lower GI bleeding (LGIB) is defined as bleeding occurring distal to the ligament of Treitz, which is placed at the junction of duodenum and jejunum [1]. Blood in the stool of a child is extremely distressful to the parents, making it a common presenting symptom in the pediatric emergency room. Different age groups in the pediatric population have different etiologies which also vary from place to place [2]. The common etiologies can be colorectal polyp, enterocolitis, anal fissures, and hemorrhoids which present as fresh bleeding per rectum, or systemic causes such as hemolytic uremic syndrome, inflammatory bowel disease which can present as fresh bleeding and/or altered blood in stools [1-5]. The general condition of the patient at presentation can vary from completely asymptomatic or mildly symptomatic (common), to hypovolemic shock requiring intensive care [3]. Common causes of LGIB vary among studies [6,7]. Due to paucity of studies depicting common etiologies in our geographical area, we conducted this study.

### MATERIALS AND METHODS

This prospective study was carried out at a tertiary health-care center (Children's Hospital, Department of Pediatrics, GSVM Medical College, Kanpur, Uttar Pradesh, India) between January 2011 and August 2012. The Institutional Ethics Committee approval for conducting the study was duly taken. We consecutively enrolled all patients in the age group 5-18 years who came to our center with gross LGIB (fresh or altered blood in stool visible with naked eyes) or two consecutive positive occult blood tests with at least 1-week interval between tests (for microscopic bleeds). We excluded those who needed emergency surgical intervention (as bowel preparation for colonoscopy could not be done), who did not give consent for colonoscopy, critically ill children needing intensive care, children with bleeding or coagulation disorders and children <5 years of age (owing to technical difficulties of the procedure).

Data regarding the patient's demographic characteristics, comorbidities, and clinical findings were recorded using a questionnaire. The colonoscopy procedure was properly explained, and informed consent from the parents was obtained

before the procedure. All patients underwent colonoscopy (small, flexible Olympus PCF-20 colonoscope) which was performed by a gastroenterologist in the medicine department of our center. The colonoscopy was performed only after the patients received 24 h of bowel preparation before the procedure. Patients received midazolam 1 mg/kg intravenously 5 min before the colonoscopy as a sedative agent and repeated once with the same dose, if required. The colonoscopic findings (any mucosal ulcer, polyp, or abnormal blood vessels, etc.) and complications during the procedure were recorded.

All values are presented as mean±standard deviation with 95% confidence intervals. Statistical differences between the parameters were tested using Chi-square test. The statistical analysis of the study data was carried out using SPSS software, version 16.0 (SPSS Inc., Chicago, IL, USA).

## RESULTS

Total 38 patients were included during the study period. Male to female ratio in LGIB was 2.16:1; thus, it was more common in males, but association was not significant ( $\chi^2=0.99$ ,  $p>0.05$ ). LGIB was most common in the age group 5-10 years (63.1%), followed by 10-14 years (26.3%). Hematochezia (passage of bright red blood per rectum) was the most common presenting symptom (78.9%) followed by melena (21.1%), which is passage of black tarry stools, per rectum. Relation of duration of illness with the time of presentation of LGIB showed that most patients (68.4%) visited the hospital within 6 months of illness.

The most common causes of LGIB were colitis and colorectal polyp (31.6% each) followed by anal fissures (21.1%). Anemia was present in 68.4% patients at the time of presentation. Recurrence of LGIB was noted in 18 (47.4%) patients (Table 1). No complications were noted in any of the patient (Figs. 1 and 2).

## DISCUSSION

We evaluated 38 children in this study to understand the clinico-etiological pattern of LGIB in children. The etiologies of LGIB vary among different studies, according to their geographical characteristics. The most detailed studies have been done in critical care settings. Motamed et al. did 164 colonoscopies for evaluating the etiologies of LGIB and found hematochezia as the only symptom in 87% of patients [8]. In a study by Arvola et al., 80% cases presented with only rectal bleeding [9]. In our study also, hematochezia was the most common presenting symptom of LGIB.

In our study population, male to female ratio was 2.16:1, and the most common age group was 5-10 years (school going age). This is in accordance with studies done by Dajani and Kamal, Khurana et al., and Poddar et al., who found male to female ratio to be 2-3.5:1 [10-12]. On the contrary, Okello et al. found male to female ratio as 1:2.5 and this difference was explained by the fact that female children have poor tolerance to GI diseases. The most common causes of LGIB in children vary depending on the age and geographic setting. In our study, both colitis and polyp were the most common cause (31.6%)

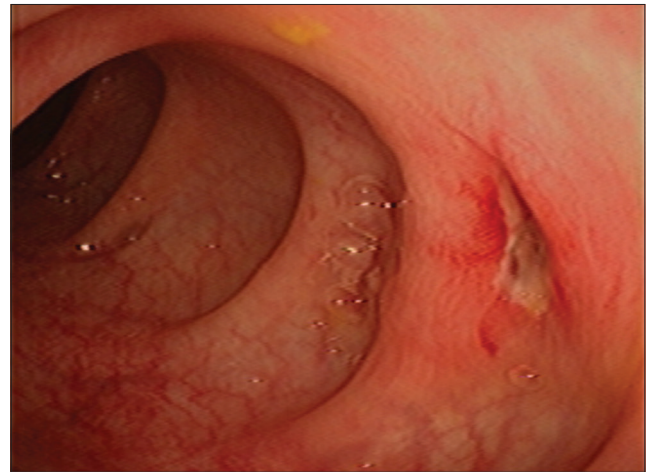


Figure 1: Solitary rectal ulcer on colonoscopy

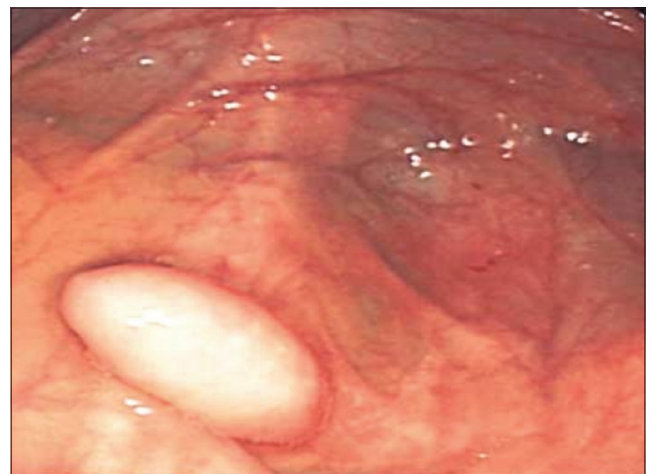


Figure 2: Sessile colonic polyp on colonoscopy

followed by anal fissure (21.1%), hemorrhoids (5.2%), and 4 cases (10.5%) remain undiagnosed (normal colonoscopy findings) that might be attributed to several causes such as hidden positions of lesions between intestinal folds, incomplete colonoscopy due to poor bowel preparation, auto-amputation of polyps and repaired ulcer or other lesions before performing the procedure [8]. The causes of LGIB in our patients are in accordance with earlier series.

Yachha et al. found the causes of LGIB as colitis (42%), colorectal polyp (41%), enteric fever (5%), solitary rectal ulcer (5%), portal hypertensive colonopathy (3%), and miscellaneous causes [13]. Balkan et al. showed that rectal polyps (53.3%) were the most common etiology, and they also diagnosed 66% of cases using digital rectal examination [14]. Bhargava et al. [15], Khurana et al. [11], Mandhan et al. [16], Motamed et al. [8], and Rafiei and Khosroshahi [17] found polyps as the common causes of LGIB. According to El-Mouzan et al., yield of colonoscopy is only 64% [18]. Yachha et al. Sahn B et al reviewed various causes of LGIB in children in his recent article (19). According to El-Mouzan et al yield of colonoscopy is 64% (20). Khatami et al did a 5 year period study (1996-2001) in 694 children aged less than 16 years with LGIB. Colonoscopy was normal in 23.1% of cases (21). Zahmatkeshan M et al found that hematochezia

**Table 1: Comprehensive table showing various characteristics of children with lower gastrointestinal bleeding**

Different variables	Frequency (%)
Sex	
Male	26 (68.4)
Female	12 (31.6)
Age distribution (year)	
5-10	24 (63.1)
10-14	10 (26.3)
14-18	4 (10.6)
Causes on colonoscopy	
Colitis	12 (31.6)
Colorectal polyp	12 (31.6)
Anal fissure	8 (21.1)
Hemorrhoids	2 (5.2)
Undiagnosed	4 (10.5)
Type of presentations	
Hematochezia	30 (78.9)
Melena	8 (21.1)
Anemia at presentation	
Present	26 (68.4)
Absent	12 (31.6)
Total	38 (100)

was the most common form of presentation followed by bloody diarrhea and occult blood (22). There is recurrence of bleeding in 47.4% of cases of LGIB in our study, which is almost similar to recurrence of bleeding noticed by Yachcha et al (13).

Our study has some limitations. First, it was a cross-sectional study that included all children who referred to our tertiary center with LGIB. This selection method possibly resulted in selection bias because only patients with more critical illnesses referred to our center. Future studies should be population based to avoid this type of bias. Second, we have excluded those who needed immediate surgical intervention. Thus, there is no data available on patients who had LGIB secondary to surgical causes including intussusception, volvulus, necrotizing enterocolitis, and toxic megacolon. Despite many reports on the identification and management of LGIB in the Western literature, relatively few reports from Asian countries have been published. Besides, there is limited information on the epidemiology of LGIB in central India, and the present study is one of the few carried out on this topic on the Indian pediatric patients.

## CONCLUSION

We conclude that LGIB is most common in 5-10 years of pediatric population (school age) with hematochezia as the most common presenting symptom. Causes of LGIB in children in developing countries are same as developed countries (polyps and colitis being most common, followed by anal fissure), but further studies are required to determine the significant correlation between findings.

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